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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,709	01/09/2002	Kuo-Yu Chou	67,200-603	6454

7590 01/05/2004

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EXAMINER

LE, THAO X

ART UNIT PAPER NUMBER

2814

DATE MAILED: 01/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/043,709

Applicant(s)

CHOU ET AL.

Examiner

Thao X Le

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 29-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 29-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (APA) in view of US 6,417,088 to Ho et al.

Regarding claim 29, APA discloses a method for forming a wiring bond pad utilized in wire bonding operation on an integrated circuit (IC) device in fig. 2 comprising the steps of: providing a substrate, thereafter configuring substrate to comprise a wiring bond pad to comprises a single metal layer 42, fig. 2, wherein single metal layer does not share single metal layer with any other material, thereafter positioning at least one IC device below, specification page 3 [006]-[007] wiring bond pad to thereby conserve IC space and improve wiring bond pad

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efficiency as a result of configuring wiring bond pad to comprise a single metal layer, thereafter locating single metal layer 28 above a plurality of intermetal dielectric (IMD) layer 46, fig. 2, specification page 9 [0027] and thereafter locating at least one IC device below plurality of IMD layer, wherein single metal layer comprises a metal-8 layer 28.

But, APA does not expressly disclose locating a buffer and bonding layer immediately above single metal layer 28.

However, Ho reference discloses the method for forming a wiring bond pad 30, column 3 line 10, comprises a aluminum buffer layer 52, fig. 6, column 4 line 1, and bonding layer 60, column 4 line 53, immediately above single metal layer 30. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to combine the buffer layer and bonding layer teaching of Ho with APA, because it would have increased the adhesion between the bond pad and bonding layer as taught by Ho, column 4 line 30-32.

Regarding claim 30, APA discloses the method wherein the plurality of IMD layers comprises at least IMD-1 to IMD-7 layers 46, fig. 2, specification page 9, [0027].

Regarding claim 31, APA does not expressly disclose wherein the metal-8 layers 28 comprising a copper layer.

However, Ho reference discloses the bond pad 30 comprises copper, column 3 lines 36. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the copper bonding pad teaching of Ho with APA, because such copper material is conventional and would have been considered a mere substitution of art-recognized equivalent values.

Regarding claim 32, APA discloses a method for forming a wiring bond pad utilized in wire bonding operation on an integrated circuit (IC) device comprising the steps of: providing a substrate, thereafter configuring substrate to comprise a wiring bond pad to comprises a single metal layer 42, fig. 2, wherein single metal layer does not share single metal layer with any other material, thereafter locating at least one IC device below wiring bond pad, specification page 3 [006]-[007], to thereby conserve IC space and improve wiring bond pad efficiency as a result of configuring wiring bond pad to comprise a single metal layer 28/30/32/34/36/38/40/42, fig. 2, thereafter locating a single metal layer above a plurality of IMD layers 46, wherein plurality of IMD layers comprises at least IMD-1 to IMD-7 layers, fig. 2, and thereafter locating at least one IC device below plurality of IMD layer, wherein single metal layer comprises a metal-8, 28.

But, APA does not expressly disclose locating a buffer and bonding layer immediately above single copper metal layer comprises a layer having a thickness in a range of and including  $10\text{KA}^\circ$ - $20\text{KA}^\circ$ .

However, Ho reference discloses the method for forming a copper wiring bond pad 30, column 3 line 10, comprises a aluminum buffer layer 52, fig. 6, column 4 line 1, and bonding layer 60, column 4 line 53, immediately above single metal layer 30. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to combine the buffer layer and bonding layer teaching of Ho with APA, because it would have increased the adhesion between the bond pad and bonding layer as taught by Ho, column 4 line 30-32.

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Regarding claims 33-37, APA does not disclose the aluminum film formed above single metal layer having a thickness in a range of  $10\text{KA}^\circ$ - $20\text{KA}^\circ$ , and wherein the single metal layer comprises copper layer having a thickness of approximately  $10$ - $18\text{KA}^\circ$ .

However, APA discloses single metal layer 42/40/38/36/34/32/30/28 having general thickness. In addition, Ho reference discloses the method for forming a copper wiring bond pad 30, fig. 6 comprises a aluminum buffer layer 52, column 3 line 3, and bonding layer 60, column 4 line 53, immediately above metal layer 30, wherein the aluminum buffer layer having the thickness in a range of  $5000\text{A}^\circ$ , column 4 line 35.

Accordingly, it would have been obvious to one of ordinary skill in art to combine the buffer layer 52 teaching of Ho in the range as claimed, because it has been held that where the general conditions of the claims are discloses in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 38-39, as discussed in the above claims 29-37, the combination of APA and Ho disclose all the limitations of claims 38-39.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Thao X. Le  
30 Dec. 2003



LONG PHAM  
PRIMARY EXAMINER